Greensward 1995

JOURNAL OF THE SOUTH WEST AND CENTRAL SCOTLAND GRASSLAND SOCIETIES

No. 38

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FOREWORD

Production of this 1995 issue of Greensward has been delayed mainly because of a change of Editor. Former Editor, Dr David Reid, was reluctantly compelled to relinquish editorship due to ill health. We all wish David a speedy and good recovery from his shoulder trouble.

Until it is possible to appoint a new Editor, I have taken over the duties in an acting capacity meantime. I wish to thank all authors, speakers and advertisers for their contributions. I am particularly grateful to SAC Rural Business Unit staff: Lorraine Reid and Linda O'Neil for their care and efficiency in typing and setting out this issue of the Journal.

In editing this issue, it seems clear that grassland farming is developing in two main directions: 1. An increase in efficiency and the application of technology on intensive dairy and livestock enterprises in Central and South West Scotland; 2. A greater emphasis and awareness of amenity and environmental considerations. At first sight these may seem to be difficult bed fellows, but examples in the SWSGS Environmental Competition show that the two approaches can go forward together. The work of FWAG advisers in Central and South West Scotland is invaluable in promoting this However, economic returns from amenity and environmental initiatives on farms still require further manipulation.

It is also important that the traditional skills of grassland management, good establishment, and use of proven varieties, developed for generations should not be forgotten or abandoned. Rather, should these be in balance with the new requirements placed on grassland farmers. The British Grassland Society and both the local, Central and South West Scotland Societies will be working together for this balance to ensure the future sustainability of grassland farming.

G E D TILEY - Journal Editor

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BGS 1994 SUMMER MEETING
Aberdeen, 10-13 July 1994

M E Castle & G E D Tiley, South West Scotland Grassland Society

The British Grassland Society held its 50th Annual Summer Meeting at Aberdeen, at the invitation of the North of Scotland Grassland Society, known as 'Norgrass' to its 400 members - one of the largest local societies in the UK. This was the fourth summer meeting of the national Society in Aberdeen, previous occasions being in 1977, 1946 and 1961, when Norgrass was formed. The 1994 meeting was very well-supported with 187 delegates including overseas visitors from the Azores and India and many from Scotland. An excellent programme included visits to 4 farms, 2 research centres, a local mart, baler factory and highland distillery. The parallel alternative programme visited castles, gardens, museums and distillery, with full evening entertainment.

General

A background of history and physical features of the region was provided during the introductory talk in the first evening and augmented by the couriers on the daily coaches. Farmland in the Grampian area is characteristically cold and hard with a late spring and early autumn, consequent on the northerly latitude. The climate is dry and the area suited to arable cropping with cereals, potatoes (for seed), turnips, oil seed rape and horticultural crops. Much of the grass is rotational and has to be 'made to work' due to a relatively low acreage. Grass areas have recently declined further after ploughing up to create set-aside. A traditional meat area, Grampian carries 21% of Scotland's beef cows and over half of its pigs, many of them 'green', i.e. kept on grass.

Historically, a relatively wealthy farming period during the 19th century was followed by a decline due to American grain imports. However, a swing towards mixed farming and the tenacity of the farmers enabled them to survive. More recently there has been a reduction in the number of dairy units and an increase in area of winter crops - cereals and oil seed rape. Co-operatives figure strongly in the area - such as in meat marketing and machinery rings - borne out of necessity and adversity.

The Grampian mountains were formerly a barrier to travel. The area was heavily glaciated with numerous rocks and stones. These were cleared and collected into very wide (2.4 m) low dykes between the fields which had poor soils. More fertile areas occurred over the Old Red Sandstone further north.

Monday, 11 July

Glensaugh Research Station, Fettercairn

The first morning visit was to the mountain research station of the Macaulay Land Use Research Institute (MLURI) at Glensaugh. Following a welcome from MLURI Director, Prof. Jeff Maxwell, some of the research work in progress was demonstrated by members of the Institute staff. Work at Glensaugh had changed from an original emphasis on production from the hills to the present needs to increase efficiency and to take greater account of the environment, including the effects of acid rain, soil pollution and nutrient run-off in water.

Grazing Ecology (Ian Gordon)

The effects of novel animal species (deer, goats and camelids) on 3 pasture types (sown pasture, native Nardus and heather moorland) were being examined. Camelids (alpaca, llama, guanaco) grazed low on heather but avoided dicotyledonous herbs so that the pastures became weedy. Goats ate herbs and browsed heather. Deer were less selective. In another trial studying deer:sheep ratios, deer being a social animal tended to graze only large patches of grass whereas sheep grazed all sizes of grass patch.

Fibre Production (Angus Russel)

Fibre production from Cashmere goats, fine wool sheep and camelids, was being studied as a means of animal diversification. Feral goats had been crossed with imported strains resulting in a wide gene pool at Sourhope Research Station. Yields of cashmere fibre combed in March averaged 250 g per doe. There was an unsaturated demand for Cashmere in the UK but a subsidy was required to make its production profitable.

A hybrid sheep, the Bowmont (Saxony Merino x Shetland ewe) with a very fine wool had been developed for some of the harshest areas of the UK. Initial work on fibre production from camelid species indicated some potential from the vicuna and guanaco.

Red Deer (Bill Hamilton)

The deer herd was used for venison production from yearlings. Up to 17 calf crops were possible before performance dropped. Deer wintered well on heather at a density of one animal ha^{-1} supplemented with hay only during snow cover. Summer grazing was on sown ryegrass pastures, with target sward heights of 5-8 cm for maximum growth rate. The effects of animal handling on growth rates and welfare were also being monitored. Optimum pen size was 18 animals; moving and mixing animals were causes of stress. It was important that animals were trained and habituated to stockmen from an early age.

Agroforestry (Alan Sibbald)

Agroforestry trials at Glensaugh were part of a UK network designed to study tree production with grazing as a means of reducing agricultural production, increasing timber and diversifying ecological niches. Effective protection of young trees from grazing was essential. To date, sheep grazing between the trees had not noticeably affected tree growth except that the shoot:root ratio was higher than in conventional forestry. The grass sward would not be affected until the tree canopy began to close.

The Glensaugh and MLURI staff were thanked on behalf of the visitors by David Grey, who emphasised the importance and value of their research to the future of the farming industry.

Dunecht Home Farms, Dunecht Estate

In the afternoon, aspects of the Dunecht Home Farm (1,290 ha), which forms part of the Dunecht Estate (totalling 24,300 ha), were described by Jim Arbuckle. 'Echt' is derived from the Pictish name for Hugh, reflecting the ancient history of the area which was a centre of civilisation 4,000 years ago. The estate includes 2,400 ha forestry with an estate sawmill plus tenanted farms of around 80-100 hectares each. It was established in the 19th century after Queen Victoria had established Balmoral. The crest motto reads: 'Do it with thy might'. The Home farm was a traditional estate farm, with small fields and wide stone dykes made from stones collected from the fields. In the 19th century depression this provided work for Irish and local labourers at one penny per yard.

An offset topper was seen at work on a set-aside field, sown with a perennial ryegrass-clover mixture from a seedbox mounted on a Cambridge roller. The field would be topped twice before grazing was permitted after 15 September. The sheep flock comprised 1,500 Castle Douglas Scottish mules, put to Charolais and Suffolk tups. Ewes and lambs were grazed at 17/ha. Kale for flushing the ewes had been poor this year due to drought. The Countesswell soil was very low in trace elements and periodic trace element and sulphur sprays were applied. A trial using 200 kg salt ha^{-1} had also given a positive response. Stock were all sold under the Farm Assured Scottish Livestock (FASL) scheme which gave a premium. Four hundred beef sucklers were kept. Originally these were Hereford-Friesians, now being gradually replaced by Holstein-Simmentals, which had different feed requirements. Three thousand big bales were tube-wrapped annually in a continuous wrap.

The original estate spent a very large sum (£70,000 in the 18th century) on tree planting and tree avenues were established. More recently a large loch was created for hydro-electricity. This was now an SSSI for greylag geese, but was also needed for sailing. There was an estate golf course and facilities provided for the local pony club, in addition to organised sporting shooting throughout the estate. Some fields near the city were to be given over to housing. Access problems now necessitated the appointment of a ranger.

The visit ended with traditional highland hospitality.

Tuesday, 12 July

Brae of Coynach, Mintlaw

On the second morning, a visit was made to Harry Emslie, Senior and Junior, who farm on the Buchan plain. Mr Emslie Senior began life as an auctioneer in the north of Scotland. He had judged stock as far afield as Brazil, including all beef breeds. His son was also a judge and a past chairman in the Scottish YFCs. From an original 108 ha the holding had expanded to 600 ha in two units. The north-facing farm had a two week later harvest than the home farm, but there was little difference in grass growth.

A flock of 780 Texel x Scottish Mule ewes was derived from crossing the Texel with 300 Scottish Mules bought in every 4-5 years to give a closed flock. Suffolk was the main tup used but Bleu de Maine was being tried. Good quality silage was made in clamps and big bales for the ewe winter

feed. Lambs were marketed under the FASL scheme. This scheme was briefly outlined by Sheena Hunter, who emphasised the aim of guaranteed standards to protect the consumer. Standards of welfare and improved record-keeping were required to qualify for the approx. 15% premium.

Grays of Fetterangus

A visit was made to the factory of Grays which makes bale handling equipment, a pasture slitter and the Tubeline multi-wrapper. Founded in 1929, the firm first made chicken houses and poultry equipment. After the war, production changed to steel equipment, e.g. trailers, rakes, diggers, for the small farm. The company workforce had expanded from 20 to 70 from 1972 to 1994. Apart from specialist equipment, everything was manufactured at the factory. There was a tour of the factory machine shops, but the highlight of the visit was a working demonstration of the Tubeliner bale wrapper. This had been invented by a local farmer, Daniel Anderson. Its main advantage was that the two ends of each bale were not wrapped, saving 50% in plastic wrapping costs. The wrapping machine could continuously wrap bales up to any length, e.g. one mile. The first and last bales had to be conventionally wrapped to seal the ends. Exports were made to N and S America, Japan, Australia, New Zealand as well as Europe. Round or square bales could be wrapped.

Cairngall, Longside, Peterhead

Cairngall has been farmed by the Godsman family since 1955 and now covers 315 ha producing milk, beef and barley. The enterprise included a peat extraction business started by Neil Godsman's grandfather in 1907. The soil was light and sandy, more suited to a wet year. The cows were being kept in at night and fed last year's silage and draff. The commercial Friesian herd was being graded to Holstein. Silage was wilted for 48 hours and turned once with a wuffler. The buildings were renewed in 1970. Calves were reared by a lady under contract.

A set-aside mix of red and white clover, with Magella and Profit perennial ryegrass was sown at 36 kg ha^{-1} in April, topped and fertilised for a silage cut later. Docks were a problem.

Peat was exported to Sweden in empty boats returning to Sweden, 1,700 t per boat, 17 boat loads in 1993. 28 ha were cut over here plus 36 ha in Caithness.

Two 8-hour shifts operate all summer to keep in front of the harvester. Six weeks drying time was required.

Glendronach Whisky Distillery

The day's visit ended with a tour of a typical highland whisky distillery. First licensed in 1826, the Glendronach distillery still used a traditional malting floor with hand raking of the malt and coal fired stills which made for a finer spirit. The fermentation and distillery processes were demonstrated, complete with a guardian cat in the still room. Final maturation occurred in oak and sherry casks to produce the required blend flavours. Glendronach means 'Glen of the bramble'. The Glendronach samples provided welcome hospitality at the end of a wet afternoon.

Wednesday, 13 July

Craibstone, SAC Aberdeen

Our third day started with a fascinating visit to Craibstone Estate, managed by Ernie Anton, which is one of The Scottish Agriculture College's farms near Aberdeen. The soils were stony sandy loams. Dairy cows, beef cattle and breeding ewes were the major enterprises. The main research project visited was an upland unit of 65 ha producing beef and sheep from grass/clover swards in a "sustainable farming system". The unit operates to strict organic standards, and the College was interested in identifying how the system could be incorporated into conventional farming methods.

The cows calved and the ewes lambed in May/June to coincide with the maximum growth of grass, and the systems were self-contained with the minimum use of expensive concentrates. For example, in winter, the beef cattle received silage and no cereals. The calves in 1994 weighed 272 kg at weaning (9 months of age) with a growth rate of 0.87 kg/day. The Highland Mules were mated in December/January and received only 20 kg concentrates per ewe each year. The livestock enterprises relied heavily on clover, and some truly excellent swards were seen. Clover was sown in reseeds, broadcast on established swards and also slot seeded. The condition of the livestock was excellent, and it was pleasing to note that studies affecting the environment were also being conducted. This work at Craibstone is highly relevant at the present time when environmental issues are so much to the fore.

ANM Group Ltd, Thainstone, Inverurie

At lunch-time we saw, in detail, the new Thainstone Agricultural Centre at Inverurie which is the headquarters of ANM Group Ltd., an 8,000 farmer-shareholder business. The centre cost £5 million to build and includes shops, the SAC office and two banks. The market has 25 loading bays, and about 400 covered pens with the capacity to handle 3,000-4,000 cattle per day. Sellers are paid on the day of sale, and there is also an electronic auction system which enables buyers to purchase stock from their own office which could be many miles away. This system saves on transport costs and also reduces stress on the livestock. The Centre has major catering interests and acts as an agency for land and farm sales.

Westertown, Rothiernorman

The final visit of the meeting was to Westertown, the farm of Maitland Mackie, where home-produced milk is made into high-value and high-quality ice cream. The 1,000 milking cows are kept in four herds and produce around 7 million litres of milk per year. The cows calve all the year round to maintain a steady supply of milk and have a concentrate usage of 0.44 kg per litre. The scale of every aspect of the farm was huge, with a staff of 75, a 13 million litre slurry lagoon, and 4 miles of underground pipes! Nearly £1 million has been invested in ice cream making plant and this will almost double in the near future.

Tea in the garden at Westertown was truly magnificent, with visitors carefully eating Mackie's' Luxury Dairy Ice Cream with one hand, and holding a wee dram in the other, whilst admiring the lawns and flowers! So ended a varied and well-balanced series of visits.

The excellent meeting concluded with the annual dinner held in the beautiful and historic Elphinstone Hall of the University of Aberdeen. John Ross, the President of the Scottish NFU, was the main speaker at this concluding part of an excellent and enjoyable Summer Meeting. Well done Aberdeen!

THE BRITISH GRASSLAND SOCIETY AND RESEARCH

Dr Cled Thomas, Head, Grassland & Ruminant Science Department and Vice-Dean, SAC Auchincruive. Past President of the British Grassland Society, 1994-1995.

The British Grassland Society has seen many changes over the year. The decision to actively take part in funding research was started by providing funds for a 50th Anniversary Postgraduate Studentship. This was awarded to Sharon Danby to work at North Wyke, Devon, on waste management problems and in particular on the effect of slurry application on the intake of grazed grass.

The Society is increasingly being asked by Government to put forward R & D priorities in grassland, so that the R & D Committee is always ready to receive ideas. Indeed the Society is very keen that farmer members should play a greater role in deciding priorities.

One of the main aims of the Society is to help transfer information from research into practice. In the last year we have discussed two main topic areas - high dry matter silage and extended grazing.

High Dry Matter Silage

Firstly we discussed the relevance of high dry matter silage, particularly in the wetter areas of the UK. It was clear from the meeting held at Myerscough College in Lancashire that by cutting lighter crops and spreading the grass rather than leaving it in the swath, relatively high dry matter contents could be achieved, even in wet conditions. Research information, however, still indicates that wilting reduces the efficiency of milk and beef production. Despite this many of the farmer speakers were confident that wilting systems resulted in more efficient harvesting and better animal production. A recent visit to the Netherlands has convinced me that we need to re-assess wilting as part of a whole system. New machines will soon come on to the market, for example, the high performance conditioner which will have dramatic effects on drying rates even in the climatic conditions that we have to work with in the west of Scotland.

Extended Grazing

This was the subject of a second meeting based at Reaseheath College in Cheshire. Grazed grass will always be the cheapest feed for dairy cows and this has prompted interest in extending the grazing season either through an earlier turnout or by grazing longer into the late autumn/early winter. The technique was introduced into Ireland through New Zealand advisers and it has recently been tested in Northern Ireland by Sinclair Mayne and here by John Bax at the Crichton Royal Acrehead Unit. Both sets of results show real benefits from extended grazing. However, the system needs forward planning, with swards being made ready from July onwards, and a completely different grazing technique to overcome the problems of poaching in wet conditions.

Silage Additives

This year farmers should be asking manufacturers/merchants if their additive is 'Approved' in the UK Scheme. Next year they should also ask in which category their additive is approved. In November 1994 the first phase of the UK Additive Scheme was launched. This will provide all grassland farmers in the UK with an independent assessment of whether particular additives are effective. The scheme is managed by UKASTA Agricultural Trades Association but the assessments are made by an expert panel of SAC, ADAS and DANI staff.

In 1995, additives were classed as either 'Registered' with the Scheme or 'Approved'. 'Registered' means that the manufacturer intended to submit information in the near future and 'Approved' means that they have submitted sufficient independent data to the expert panel to show that their additive works. In November 1995, the Scheme will be extended. Firstly, additives will be approved in specific categories to provide the grassland farmer with even more information. The categories are:

A. Improvement in animal production; milk or beef production.

B. Improvement in silage intake, digestibility.

C. Improvements in fermentation, losses etc.

Secondly, the Scheme will also monitor products on the register. The details are still being worked out but part of the UK scheme should be in operation this coming winter.

50th Anniversary

The 50th Anniversary Meeting of the British Grassland Society was held in Harrogate in early December 1995. There was be a full programme of interest to both farmers, research workers and advisers. One evening was reserved for a discussion between BGS and Local Society Representatives. The national Society wants to do more to help both at local and regional level. We also want to make sure 'Grass Farmer' can provide a better service in transferring research information to members, including summaries of information that is published in the BGS Journal: '*Grass and Forage Science*'. Grass is the most important crop in the west of Scotland. If you have any comments or ideas on how the BGS can help the local farmer through its publications or in any other way, please let me know.

SOUTH WEST SCOTLAND GRASSLAND SOCIETY COMPETITIONS 1995-1996

Silage Competition

The 23rd annual silage competition will take place in 1995-1996, with the same rules and prizes as last year. Marks are divided into 35 for chemical analysis and 65 for on-farm judging, sub-divided into a) silage production and utilisation (45 marks) and b) silage inspection and effluent control (20 marks). Increased attention will be paid by the judge to safety considerations, and the approach to animal welfare, following a lead from the British Grassland Society. The local competition has classes for dairy, beef/sheep and big bales.

Grassland Environmental Competition 1995

This is sponsored by Dairy Forum, Redhill, Surrey and judging of entrants will take place during the early autumn. Marks are divided equally between a) good commercial grassland and livestock management, and b) sympathy for the environment and practical management to promote the conservation of wildlife.

A **Grassland Ideas Competition** and a **Photographic Competition** will also be run if there are sufficient entries.

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BACTENSIL 2000

Neil Dale, Rumenco, Burton-on-Trent

Forage is now becoming more and more important in dairy cow rations. We are all trying to produce more milk from forage, but this means the forage we use must be of the highest quality.

Whilst overall management of the forage making process is very important, forage additives must now be a major part of this operation. The days of using an additive purely as an insurance policy are gone, and we must now consider them in terms of improving overall forage quality.

With the advent of the UKASTA forage approval scheme, it should now be much clearer as to how effective an additive can be.

Bactensil 2000 has achieved approval by UKASTA in category C1 (improved fermentation) which follows approval by INRA in France and the DLG in Germany.

Biologicals such as Bactensil 2000 provide a good source of bacteria to help produce lactic acid and thus help fermentation. Enzymes also provide a boost to the available sugars, to ensure the bacteria are able to work to their full potential.

Bactensil 2000 has been used successfully on both clamp and big bale silage, and it has also worked well on maize silage.

It provides a cost-effective method of improving silage quality backed up by Rumenco's well known advisory back-up service.

Further information can be obtained by telephoning 01283 511211.

SWSGS EVENING FARM VISITS
SUMMER 1994

G E D Tiley

DUMFRIES - G Walker, Lakehead, Closeburn, Thornhill - 21 July

The first summer evening farm visit was to the Dumfriesshire farm of Grahame Walker and his family at Lakehead, Closeburn. This is a 120 ha all-grass farm with a long narrow layout and run by Grahame with a dairyman and a tractor man. The soils are mainly sandy and require no draining but they may burn in dry weather. There were no trace element problems but the soils were 'hungry' and required frequent manuring. Some peaty areas suffered a more restricted grazing season.

The 170 Holstein-Friesian cows averaged 7,225 l, with a m.o.c. of £1,328. There was an upgrading policy in which older, less healthy cows were culled and new heifers with improved genetic potential brought in at the rate of 45 per year. The cows were block-calved in November and the heifers in September. Heifers were bulled at 400 kg using synchronisation with an average calving age of 23 months. Heifers were made to lose condition before their second calving by means of tight grazing. All bull calves were sold direct to Europe. The cows were set-stocked in a distant 20 ha field by day and rotated in 8 paddocks the steading by night.

Silage was the key to success and Mr Walker aimed for the highest possible quality. The first cut from 60 ha was taken on 20 May and a second cut from 48 ha, using a PZ mower and a Fahr chopper. 5.5 m cuts were rowed into one swathe after a 12-24 hour wilt. There was a 6-man team working in conjunction with Grahame's brother. 12-16 ha were made per day with a season total of 320 ha. Slurry was applied by contractor (D Laird) in February, plus 130/30/43 kg NPK ha^{-1} fertiliser for the first cut. The 1994 first cut was 25 per cent less than normal, so an additional third cut was planned for making into big bales.

A successful reseed containing late tetraploid perennial ryegrass was seen. The old sward had been treated with pre-harvest glyphosate 5-6 days before cutting, which greatly shortened the reseeding operation. The field was ploughed after slurry application then the grass drilled at half-rate in two directions. High yields of good quality silage were now being obtained.

The farm includes 2,700 m of railway line which harboured an enormous rabbit population which grazed 20-30 m into the silage fields. An agreement had been reached to fence the line with rabbit-proof fencing. The water supply for the steading and surrounding field troughs derived from a spring-water source 3 m deep in a depression near the steading. The water circulated through the milk cooler to a 30,000 l tank which fed the water troughs.

The Society greatly appreciated the opportunity to visit Lakehead and thanks the Walker family for their warm hospitality.

KIRKCUDBRIGHT - R Paton, Torr, Auchencairn, Kirkcudbright - 28 July

Visitors to Torr were treated to a conducted tour complete with map of the extensive farm area which borders and overlooks the Solway estuary. The farm area included: Cereals (59 ha); Set-aside (9 ha); Rotational Grass (6 ha); Long-term and Permanent grass (71 ha); Rough and marginal grazings (96 ha); Woodland (36 ha).

Mr Paton's father had taken over Torr after leaving the Royal Air Force. The hill area was bought in 1981 and 64 ha at Standingstone were added in 1993. Old Torr was the site of the original farm which grew oats and potatoes and carried wintering stock on the permanent pastures. The original historic orchard had been fenced off using ESA support. A new hedge had also been planted. The coastal strip was an SSSI, on which summer grazing was permitted. Torr wood, originally oak and scrub, was planted to spruce and larch in the 1950s and was now due for clear felling by contractor.

There were 120 ha of low-lying flat land with silty soil and wet areas. This area had been drained by 500 Irish labourers in the 19th century, with tidal valves installed. These were now derelict and awaiting replacement since the area was subject to flooding, as in the high tides of 1967 and 1980. Land distant from the main steading was silaged and grazed in the autumn. Slurry was applied to first and second cuts. The large capacity slurry store gave flexibility in timing of application. High quality silage was made, which earned the runner-up prize in SWSGS 1993 Silage Competition. The cut grass was tedded twice during 24-48 hours, aiming for 30+% dry matter for tower storage. 600 kg year^{-1} of home mix was fed in the parlour, 5.5 kg/day

to high yielders and 1-2 kg for low yielders. Wooden cubicles were being installed.

The bracken areas on the hill area had been reclaimed to provide grazing for in-calf heifers. Ammonium phosphate was applied in spring, followed by 25/13/13 kg NPK ha^{-1} top-dressing. Stock on the farm were 160 cows and followers, with up to 200 beef animals bought in as stores and sold finished. Sheep were also wintered.

Torr Farm contained an interesting combination of high quality grassland and stock farming, with a range of environmental, landscape and historic features. The Society thanks the Paton family for arranging this visit and for their warm hospitality.

AYRSHIRE - J & W Welsh, Laigh-Arness and Warnockland, Waterside, Fenwick - 2 August

The present enterprise of 3 farms, almost 400 ha, had been built up since 1954, when the Welsh brothers' father had first arrived.

Currently the grassland area totals 320 ha (including away grazings), with 64 ha spring barley. There are 240 cows with a milk average of 6,100 l. 170 cattle are fattened annually from the herd and 300 hoggs are wintered. Three men are employed. Most of the buildings at the two main steadings had been erected using home labour.

At Arness there was a 120 cow cubicle shed and a 16/16 parlour. Silage was self-fed which was low cost, avoiding the use of machinery. There was a 900,000 l slurry tank in the ground with a further 450,000 l storage in a second tower and under the slats. As the steading was situated in a village, it was essential to guard against smell, so the input pipe extended to the bottom of the store. A 1 cm hole at the top of the pipe prevented siphoning. A home mix was based on barley from a 200 tonne tower, with other constituents stored in second-hand seed silos and molasses in a tank. High P minerals were used and high Mg in spring.

Calving was in batches to achieve evenness, especially for beef production. Only Friesian bulls were used and Angus for the heifers. The Angus-X heifers were in demand for suckler herds. An 8 ha area of peaty ground had been planted to Sitka spruce in 1974. This now provided good shelter and

had dried out both the wooded area and the surrounding fields. Mr Welsh aimed to plant a few trees every year.

At Warnockland, the steading and farm had been very run-down on entry in 1987. Many of the buildings had since been renovated, 50 field gates had been replaced, the farm road resurfaced with asphalt and fields reseeded in 20 ha blocks. A barley-silage rotation (3-4 years barley, 6-7 years grass) ensured effective dock control. All dung was applied to the barley stubble. A slurry lagoon had been replaced by a modern slurry tower. Approx. 250 calves were reared annually by Mrs Welsh. An amenity area of broad-leaved trees had been established at the entrance to the farm and plans were being made for improving the hedges and other potential wildlife areas.

The Society thanks the Welsh brothers and their families for this visit, and for their kind hospitality.

WIGTOWN - O Watt, Meikle Galdenloch, Leswalt, Stranraer - 9 August

This was a joint farm walk with Dumfries & Galloway FWAG to an extensive beef/sheep farm of 312 ha, part of which borders the sea as a coastal SSSI. The Watt family had farmed Galdenloch for 17 years. The previous two owners had practised traditional stock farming on natural hill vegetation. Some of the hill grazings and heather had been improved since by rotavation and pioneer cropping, applying lime and fertiliser and sowing down to grass. The reseeded areas gave greatly increased stock production compared with the original heather, though the heather-grass combination was good for the stock. The grazings received 190 kg ha^{-1} di-ammonium phosphate in spring and 37 kg N ha^{-1} in early summer. Improved areas induced copper deficiency so that high Cu feeds such as draff were fed. Stock were also dosed for selenium. There was a rush problem on parts of the reseeds and control by topping or weed-wiped glyphosate was necessary, though some rushes gave shelter to the lambs in spring.

The soils were largely sandy or gravelly and the wet areas were useful in summer. 72 ha were used for silage, made mainly into big bales. A rape-barley arable silage mixture was used for reseeding. The stock numbered 170 Sucklers and 630 ewes. The cows and calves were strip-grazed and the calves sold off their mothers to develop bloom on their coats. A new lambing shed was fitted with a Netlon windbreak, which required strengthening with strips of 'Paraweb'.

The farm exhibited a number of wildlife conservation features including amenity tree planting (broad leaves) on an exposed site near a small loch, and the coastal SSSI with a diverse flora, including orchids and coastal bird life. The bay (Salt Pans bay) was used to produce salt in the 18th century. There was an iron age fort and a ruined castle near the steading. Galdenloch croft contained two paddocks of old grassland that had remained unfertilised since 1930. This would be lightly grazed by cattle and not fertilised to conserve the bent-cocksfoot sward which was rich in herbs.

The Society and local FWAG wish to thank the Watt family for their hospitality and farm visit, and in particular for providing tractor and trailer transport to the distant seashore and hill grazings.

GRASSLAND NITROGEN

Grassland Nitrogen. D Whitehead, University of Reading, 352 pages. Price: £49.95.

This review of information on grassland nitrogen in soils, fertilisers, in the plant and in animal consumption and finally in the environment was published in late 1995 by CAB International. It deals with the chemical transformations of nitrogen in the soil-plant-animal system, and the effects of different management practices; how to arrive at optimum rates and responses and to achieve a nitrogen balance.

The book provides an up-to-date overview of grassland nitrogen in all its aspects, for advisers, students and those interested in the way nitrogen cycles through grassland in agriculture and in the environment.

JOTTINGS FROM THE ISLE OF MAN

Extracts from Manx Grassland Newsletter No.16, September 1994
John Harris, Manx Grassland Society

During the year 1993-1994, the Manx Grassland Society arranged two 'overseas' tours: Tour of Co. Down, Northern Ireland, 18-20 October 1993 and Tour of East Cumbria, 10-12 May 1994.

Northern Ireland Tour

The Manx Society visited 5 farms, all dairy or dairy/beef, the Mountains of Mourne ESA and the Norbrook Laboratories, Newry. The dairy units were high yielding and efficient, with the aim of maximising the use of grass and forage for milk and beef production. Maize was grown and Extended Grazing was being practised. This was recommended only for productive stock and for only 2-3 hours per day. The cows should be brought in as soon as the first one lies down. Good roadways and paddock gateways are essential. Numerous press articles confirm the popularity of Extended Grazing in Northern Ireland. Calf cubicles were a typical Northern Irish feature for both newly weaned and older calves, when slats were used.

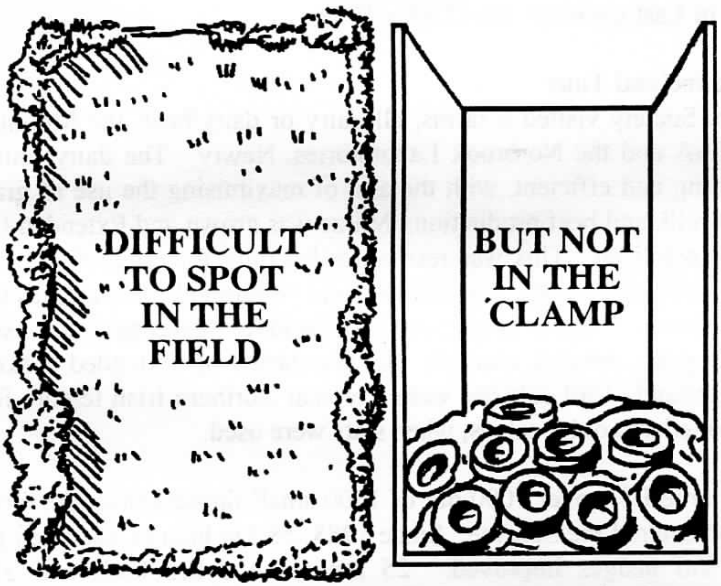
In the Mourne ESA over 1000 out of 1600 small farmers (average farm size, 18 ha) had entered the Scheme. Since 1988, 58 km hedges had been planted and 144 km hedges improved; 25 km stone dykes built and 335 km maintained; 2800 buildings painted and 790 old buildings restored; 300 gates restored.

East Cumbrian Tour

A party of 16 visited 5 farms, all dairy with sheep and/or beef and in upland situations (700-1000 feet; 210-300 m) near the Eden valley. Features seen were : grass and stock were impressive on all farms, fodder beet, wholecrop wheat, dirty water irrigation, use of broiler manure and sewage sludge. Digital dermatitis was a problem in the dairy cows.

The Manx Society also arranged three local farm walks to dairy farms on the Island. There is, in addition, an annual Grassland Management Competition. The 1993 winner showed a good combination of grazing and conservation with maximum use of grass and wasting nothing. There was a combination of young and old leys with high clover content.

SULPHUR DEFICIENCY



Lack of sulphur has always been difficult to identify in the field. Yet leaving a deficiency uncorrected, could cost you up to £40/ha in lost yield. So Hydro Agri have developed a straight forward Silage Fitness Check to help you spot a potential problem before it is too late to correct it.

Your merchant can complete the FREE SILAGE FITNESS CHECK in just a few minutes and even if sulphur proves not to be a problem for you, they will be able to give you a new recommendation to check your existing fertilizer programme against.

Ask your merchant for a free HYDRO SILAGE FITNESS CHECK today. It will take you minutes and could save you £££'s.

For more information please ring (01469) 571141
or
Contact your Local Hydro Merchant for Details

FERTILIZERS FOR PROFITABLE SILAGE

HYDRO

MINERALS AND TRACE ELEMENTS

A Meeting of SWSGS in the Wigtownshire Ruby Football Club, on 27 October 1994

C Lister, Carrs Agriculture Ltd, Carlisle

This meeting was sponsored by Carrs Agriculture, Carlisle in association with Tarff Valley, Twynholm. The speaker was Dr Cliff Lister, a member of the technical staff at Carrs Agriculture. He was accompanied by Gary Mountain and sales staff from Tarff Valley.

Dr Lister briefly outlined some of the mineral problems associated with grass, and then described deficiencies of cobalt, zinc, copper and selenium.

Mineral problems were of two main types:

1 absolute deficiency where there was a dietary shortage of one or more minerals; and

2 induced deficiency brought about by an excess or interaction of other mineral elements.

The classic mineral response curve was asymptotic. Slight deficiencies produced sub-clinical symptoms where performance was not as good as it should be. Severe deficiencies gave rise to serious clinical symptoms, such as staggers (Mg deficiency) or swayback (Cu deficiency).

In recent years, a new deficiency, that of Cobalt (Co) in sheep had come to light. This had been researched by Dr Alan McPherson, SAC Auchincruive. Three treatments (Co deficiency throughout pregnancy, Co deficiency only for the first half of pregnancy, and adequate Co throughout) were imposed on breeding ewes.

Lambing percentage increased with better Co levels. Greater Co deficiency led to more still births and less vigorous lambs with lower immunity. Deficient lambs took longer to stand and to suckle. The foetus of deficient ewes was susceptible to Co deficiency from an early stage. Co produced a rapid improvement in cases of milk fever.

Minerals in Grass

An ADAS survey confirmed that grass was relatively poor in minerals with a high frequency of samples containing less than dietary requirements for grazing animals (see Table). This was due to high yields arising from nitrogen use, species grown (mainly perennial ryegrass) and possibly due to variations in soil pH.

Table: Frequency of grass samples with less than mineral contents required in animal diet (from ADAS survey)

Mineral	Samples below dietary requirement %
Calcium	50
Phosphorus	65
Sodium	70
Copper	90
Manganese	20
Zinc	85
Cobalt	70
Iodine	100
Selenium	99

Fertiliser use could also affect availability. The application of magnesium limestone could result in Mg competing with Ca for the carrier protein. Potash also reduced available Mg in spring. Ca and P were reduced as herbage grew older. Clover and herbs were mineral-rich compared with ryegrass. The grazing animal can practice selection, whereas this is not possible with conserved grass (silage or hay), which show a wide variation in ash contents.

It is worth remembering that milk contains 1% minerals, representing an export of 10kg minerals for every 1000 litres milk sold.

Cobalt

Co was needed for the rumen micro-organisms to manufacture vitamin B12 in which Co is chelated in the centre of the molecule. However, Co is not

supplied in a chelated form. Cu, Zn and Se are now available as organic chelates which are more readily available for absorption by the animal.

Zinc

Zn helps digestion, carbohydrate metabolism and keratin production. The use of chelated Zn was reputed to reduce lameness and 'concrete fatigue' arising from better hoof growth. Health was improved and mastitis spread reduced.

Copper

Copper is a component of many enzymes and acts as an enzyme co-factor. Deficiency leads to de-pigmentation, poor fertility, reduced growth and poor nerve tissue (sheep). Copper deficiency can be induced through high levels of molybdenum and sulphur. Cu supplements improve growth, milk yields and quality, and disease resistance. A chelated Cu product was said to be resistant to molybdenum and sulphur interference, and led to higher Cu levels in the liver. Continental sheep breeds were very intolerant of Cu, as also were the Suffolks, though hill breeds were more tolerant.

Selenium

Se works with vitamin E to prevent cell damage. Se is an active component of glutathione peroxidase, which is an active cellular anti-oxidant. Deficiency leads to infertility and calving problems, poor hair quality, reduced mastitis resistance, weaker hooves, and muscle weakness, 'white muscle disease'. Selenium can be injected or is now available as a Se-yeast, an organically bound form (Se-methionate protein) with a higher availability.

Dr Lister concluded by advising care in the levels of trace elements fed as excessive doses, eg: of Se could be toxic - 'enough is plenty'.

SCOTTISH REGIONAL SILAGE COMPETITION 1995

The 1995 Scottish Regional silage competition was won by Ian and Russell Kerr, Kirklands, Dunsyre, from the Central Scotland Grassland Society. John McClusky from the East of Scotland was runner-up. Regional Judge was Michael Milligan. The Kerr brothers represented Scotland in the UK National silage competition, which in 1995 went again to Wales, where it was won by Tom Tudor, a beef/sheep farmer, for the second time.

MARKETING AND THE OUTLOOK FOR BEEF

A Meeting of the SWSGS in the Cairndale Hotel, Dumfries on 17 November 1994

DJ Thomlinson & I Galloway

This meeting was jointly sponsored by Harrison & Hetherington Ltd, Borderway Mart, Carlisle and Scotbeef Meat Packers, Bridge of Allan, Stirling, represented respectively by David Thomlinson and Ian Galloway.

MARKETING - David J Thomlinson

The speaker began by mentioning some of the many changes that had taken place in marketing. Since 1940 numbers of markets in Britain had halved from over 400 to less than 200. This was because transport systems were better and it was easier to move livestock over large distances. Markets had been traditionally sited close to railway stations and the pens were designed to take the number of animals that would fit into a rail wagon. Formerly also there were numerous small butchers which had now dwindled to very few in favour of a greater number of wholesalers.

Carlisle was one of the largest marts which attracted buyers because they could be sure they could get all the stock required. In the future market centres may be even bigger. The auction market was the best sorting house obtainable in that the buyer could choose whether to take stock and the seller could decide when to sell, though in practice the buyer had more sway. It was not a waste of time for farmers to attend markets, since market day was the time for their market research which was essential for the business. Markets were also one of the best meeting places for farmers.

Auction markets were open to public scrutiny so that animal welfare and handling of stock will become increasingly important in the future. Livestock were a perishable product and modification of handling and transport may become necessary. The speaker felt the industry was not doing enough to educate the general public in how stock were handled, to change the image of 'tapping animals with a stick'.

All stock entering the market were now checked by two animal welfare officers and by a vet. Farmers were being encouraged to look after stock and keep them clean and not to sacrifice welfare for financial expediency.

Reference was made to electronic auctions which work in some areas, especially with sheep, but an auctioneer was required to operate the system.

There would be in future a need for 'Traceability' of all animals, already operated in some markets. Cattle Control Documents (CCDs) were now being used, with high costs for handling. A way forward would be to use electronic tags which could be read as the animal runs through. Buyer and auctioneer could then operate through a central computer, as used in parts of Europe.

In conclusion, Mr Thomlinson emphasised that the auctioneer must remain independent, to preserve vendor/buyer confidence. The most important assets were personality and integrity. Insurance and finance were other aspects of farming business handled by auctioneers.

BEEF MARKETING - Ian Galloway

The present Scotbeef company had originated from an association of 56 butchers shops in 1922. During the post war period, meat canning and sausage making were added. A bacon factory came into operation at East Kilbride in 1950, followed by an on-line meat plant in 1962. This had now been replaced and the shops had been sold.

Shopping habits had changed since the introduction of the 5-day week, and of supermarkets. Men could accompany their wives and influence the choice of meat. Shops formerly bought meat from wholesalers, but supermarkets buy direct from designated abattoirs. The supermarket's requirements were: volume, attractive product, not fatty. Vegetarianism was increasing, especially in some schools, but the main threat to the meat market arose from the fact that the public had a lower protein requirement than before the war, due to a more sedentary lifestyle. If JCBs and tractors were abolished, there would be a meat deficit! Manual workers used to eat at home because there was no works canteens. People now eat more for pleasure than for a necessity.

30 years ago a typical meat shop would have had a mere 10 items on display. Now there could be up to 130 items of chicken alone.

Competitiveness in the meat market will be on the basis of **Quality** rather than price. The producer and wholesaler must work closely together to understand market specifications. Shoppers are more actively interested in what they are buying, and where it came from. As mentioned by David Thomlinson, **Traceability** was essential, and this was being supported by the larger auction companies. It was also essential to keep animal welfare standards high. Bruised meat or dead animals were in no-one's interest.

The meat trade resembled a factory, with seasonal traders, low fat requirements, developing new lines in order to improve sales. Housewives did not wish to spend long hours in the kitchen, thus oven ready items with short cooking times, and no fat or gristle were being developed. Products with a marketing edge were required. The meat trade should report back its requirements to the producer who in turn should ascertain what the market required in terms of animal type and season. Feeding should be standardised and marketing groups should try to standardise products across different farms.

Mr Galloway felt that Europe could outstrip America in producing food to feed the world. He summed up beef market needs as:

1 Quality
2 Welfare with clear public relations
3 Innovation within meat plants to ensure competitiveness
4 Improved communication between the farmer and the meat plant.

CENTRAL SCOTLAND GRASSLAND SOCIETY

SILAGE COMPETITION 1994

HF Seeds Silage Prize-giving Meeting of the CSGS on 11 January 1995

Silage Judge: J P Baird, Nether Affleck, Lanark

The Chairman, R Millar, introduced the Judge, Jim Baird of Nether Affleck, who had won the silage competition in 1994. Mr Baird said that judging had taken two days and was very enjoyable. The first day involved visiting five farms in his own locality instead of "exotic" far away places such as Crieff and the Lothians. On the second day he had had his first visit to the isle of Bute to judge Drumachloy.

It was worthy of note that none of the finalists' farms had forage wagons or complete diet feeders. There was more waste on the pits than expected, indicating that perhaps more and better sheeting was required and that new sheets should be used on the sides. Feeding efficiency was at a high level with most farms subscribing to the SAC Milk Manager package. The figures showed all were doing a good job.

One factor which surprised the judge when visiting the five Lanarkshire farms was the large variation in rainfall which occurred over a short distance. Other points of interest included a farm where all the cows were dried off before Christmas and the cows were fed silage only twice per week using a silage block cutter.

The prizes were presented to the prizewinners by Ian Watson, Managing Director of HF Seeds who sponsored the competition. Marks for the eight finalists inspected are shown in the Table.

The first prize and HF Seeds Cup was awarded to the overall winner J Kerr & Sons, Kirklands, Dunsyre, Lanarkshire. Runner-up was J Clark & Son, Dunrod, Inverkip, as in 1993. A & A Struthers, Millhill, Lanark was third and D Lyon, Drumachloy, Rothesay, Bute was fourth. The Hamilton Reco Trophy for the Best Beef and Sheep Entry was presented by George Hamilton to D M Lyle, Mid Cambushinnie, Dunblane.

Final Marks for Analysis and Inspection by the Judge

	Analysis (35)	Inspection (65)	Total (100)
J Kerr & Sons, Kirklands, Dunsyre	33.05	62	95.05
J Clark & Son, Dunrod, Inverkip	31.98	60.5	92.48
A & A Struthers, Millhill, Lanark	31.47	60.5	91.97
D Lyon, Drumachloy, Rothesay, Bute	31.29	58.5	89.77
W K Carruthers, Nerthon, Auchheath	32.00	56.5	88.5
J Bannatyne, Drumalbin, Carmichael	31.52	53.5	85.02
D M Lyle, Mid Cambushinne, Dunblane	27.04	59.5	86.54
P Clemson & Sons, Skellyton, Larkhall	26.52	54	80.52

Following the prize-giving, Mr Ian Watson, HF Seeds spoke on Grass Varieties and Seed Mixtures.

CSGS SILAGE PRIZE-GIVING MEETING

A Meeting of the CSGS on 11 January 1995

GRASS VARIETIES AND SEED MIXTURES

Ian Watson, Managing Director, HF Seeds Ltd.

Several factors have led to increased prices for grass seed. A depressed market in the last few years has had the effect of building up stocks in merchants' warehouses with depressed prices for producers who in return reduced their area of production. The surplus stocks have now gone but 1994 saw a 30% reduction in the European grass seed production area owing to poor weather and poor establishment in 1993.

Former communist countries, such as Poland and the Czech Republic, received large government subsidies for producing grass seed which was then exported to earn western currency. These subsidies have since been withdrawn, resulting in these countries becoming net importers rather than exporters. The demand for grass seed in the autumn of 1994 was high, resulting in a borrowing from 1995 stock.

The result of these factors is a shortage of good UK varieties of grass with intermediate and late diploid perennial ryegrass being particularly scarce. Owing to EEC rules, European varieties are being imported, some of which will be unsuitable for our climate, while some old and outclassed varieties such as Talbot and Meltra are still on offer.

In general, tetraploid PRGs are in better supply than diploids. The result of the shortage is that quality standards will fall and very little certified at HVS standard. Some merchants may have to take what is available and a number of good varieties will be unobtainable. Increased proportions of old outclassed varieties and of tetraploids will be included in mixtures.

Single variety price increase of 40-70% will result in an average price increase of normal seed mixtures of around 20-30%.

Hence, prices will be higher, variety choice poorer and seed quality lower.

The Importance of Variety

Important variety characteristics are:

- Yield
- Heading date
- Seasonality
- Sward density
- Forage quality

Although the average difference between a good and poor variety is in the region of 8%, this can have a marked economic effect.

	Variety		
	Poor	**Good**	**Difference**
Yield DM (t/ha^{-1})	9.8	10.5	0.7
Fresh yield (t/ha^{-1})	48.9	33.0	+4.1
Value (£/ha^{-1})	964	1043	79

i.e. a difference of around £80 for every year that a grass ley is down.

Early Perennial Ryegrass (PRG) Heading dates 12 May-3 June

Starts growth two weeks earlier than intermediate PRG. Its growth characteristics make it less useful in a 2-cut silage system but suitable for an intensive 3-cut silage system. It is good for early grazing for sheep but tends to become stemmy after grazing. The seed is relatively cheap in a normal year because of high seed yield.

Intermediate PRG Heading dates 4-16 June

Less productive than early PRG in spring but similar overall yields. It does not run as readily to stem after cutting as early varieties. Generally more expensive than early PRG.

Late PRG Heading dates 17-30 June

Good midsummer and total annual yields. Like intermediate PRG does not run to stem after grazing but tends towards prostrate growth and high tillering, giving a good sward density. Particularly good for long-term grazing.

Tetraploids

Produce bigger plants with broader leaves. Tetraploids are higher yielding with more upright growth and form a more open sward with fewer tillers. Tetraploids contain up to 2% more moisture, but with high sugar content, are palatable and good for silage. A good grass seeds mixture needs both diploids and tetraploids. Tetraploids tend to be more vigorous than diploids and in time will increase their proportion of the sward so in a short-term mix there are 40-50% tetraploids, whereas a long-term mix will contain 30-40% tetraploids.

The familiar wave-like grass growth curve of a seed mixture is composed of the sum of growth curves of its constituent varieties. The aim is to lessen the steepness of the gradient of production fall which occurs after late spring or early summer.

Example of Varieties for Best Spring Growth:

Early PRG:	Moy
Intermediate:	Belramo, Napoleon (T) and Merlinda (T)
Late:	Lasso, Preference, Tivoli (T)
	(T) = tetraploid

Seasonality of Growth A well-balanced mixture should produce the best possible **whole-season performance**.

Seasonal Yield expressed as % of Control

	1st Cut	2nd Cut	3rd Cut	Aftermath	Total Annual Yield
Twins	103	102	106	103	104
Lasso	126	91	99	100	109
Merganda	107	98	102	104	104
Mixture	112	97	102	102	106

Sward density is important. A dense sward has less chickweed, resists poaching, gives better grazing, and loses less moisture in dry conditions.

Persistence Tetraploids are less dense than diploids but are persistent. Density is generally associated with persistency in diploids. Persistency increases: Early PRG -> Intermediate -> Late PRG

Varieties with good persistency:

	Diploid	Tetraploid
Early PRG	Moy	Labrador
Intermediate PRG	Merganda	Twins
Late PRG	Profit, Duramo	Condesa

Balancing a Mixture

Variety A - Excellent spring growth
Poor sward density

Variety B - Poor spring growth
Excellent sward density

A + B = Good spring growth + Good sward density

MILKING MACHINERY DEVELOPMENTS

A Meeting of the Central Scotland Grassland Society on 11 January 1995

Mike Murray, McCaskies Farm Supplies

To harvest milk requires Cows, Men, Machinery, Buildings. Cows, Men and Machinery must all work satisfactorily.

A milking parlour should be thought of as a Milking Centre rather than a parlour. Parlour machinery has a 10-15 year life span, so design is important.

When considering the installation of a new Milking Centre, the future must be taken into account:

- Production level now and in the future.
- Number of milkings - feed, etc.
- Availability of qualified staff.
- Size of cow groups in herd.
- Milking time 1-8 hours.
- Level of mechanisation to be employed.
- Availability of financing.
- Dairy owner's or manager's preference.

What size of parlour? - project herd size; labour needs and when will outside labour be needed; how many stalls can one milkman operate (very variable)?

Mechanisation increases operator efficiency, as does not feeding in the parlour.

How do you get cows to move through gates? Forage gates can be used, but a unit had been visited where the herd was trained with fencing gates combined with a bell ringing. The cows now moved very smoothly in response to the bell only.

Length of pre-milking routine affects throughput, such as dry wipe, teat drop, etc.

Stall type determines walking distance.

- Low yielding cows obviously milk more quickly than high yielders.
- Plan the number of people milking in large units up to four.
- Determine the milking session length.
- Consider mechanisation.
- Calculate the costs.
- What is your preference.

Parlour Efficiency

- Stall type, style and configuration of stalls selected.
- Herringbone, single or parallel.
- Number of milkings/day and production levels.
- Training and motivation of parlour operator.
- Management and practices used, e.g.: grouping or production levels, size and design of handling facilities.

Comparing Stall Types

Herringbone Standard Exit
One Rapid Exit Herringbone
One Individual Stall
One Rotary (no post-milking check possible)

Milkings Per Day and Production Levels

Milkings/Day	**Average Group**
2	8-10
3	6-8
4	4-6

Calculate Tasks and Routine Time

1. Load cows into stall.
   Delaying start until side is full loses 2 minutes.

2. Perform milking routine.
   Clean cows take less time.

3. Attach milking units.

4. Adjust milking units.
   Move unit forward not back for more milk (more butterfat towards end of milking).

5. Remove units manually or automatic.

6. Post milking - teat dipping, checking all milk drawn, release cows.

Automatic teat sprayers less efficient because canal into teat closes 20 seconds after machine is removed.

Use most efficient approach, e.g.:

- Series approach, ie: all dipped.
- Zone approach - reduced throughput.
- Both approaches create idle time.
- If the parlour is too big then units are idle, too small then man has idle time.

New milking set-ups in this country only need to meet UK standards which are lower than European or USA standards, and therefore may not be sold abroad. New milking set-ups designed by Mr Murray are built to 3A World Standard, which is only exceeded by the California Standard.

Planning Beyond the Parlour

Existing buildings can compromise a new parlour. The tank roof should be treated to food hygiene standards, e.g.: in walls and roof finish. Power room housing vacuum pump generator, etc. Allow plenty of space to allow access for maintenance.

- Storage space for chemicals and animal health products to COSHH standards.
- Office space.
- Employees' area, if two or three staff involved.
- Collecting yards in trainer gates.
- Treatment and AI handling, calving pens, etc.
- Separation pens/gates/lanes.
- Foot bath.
- Waste management.
- Access for cows, vehicles, etc.

A video on robotic milking was shown, where a cow using a transponder entered a milking stall was fed concentrates, the udder washed, the cow milked, then released - the whole operation being carried out automatically.

CENTRAL SCOTLAND GRASSLAND SOCIETY
17th Annual Silage Competition 1995-96

The 17th Annual Silage Competition of the Central Scotland Society will be run in 1995, with the same rules, marking and prizes as in previous years. All silages of Society members which are sampled and analysed by SAC will be eligible for entry this year.

Tom McCombe (2nd left) and son, David (2nd Right) were awarded the 1st Beef/Sheep prize and BP Nutrition Trophy for the second year in succession in the 1994 SWSGS Silage Competition. The prizes were presented by Bill Scott (extreme left), Senior Manager, Bank of Scotland, Castle Douglas, with SWSGS Chairman John Marshall (centre) and Silage Judge, Alistair Watt (extreme right).

SWSGS SILAGE COMPETITION 1994

A Meeting of the SWSGS in Oswald Hall, SAC Auchincruive, Ayr on 12 January 1995

GED Tiley

Silage Judge: Alistair Watt, Coldhome, Keith, Banff

The Society's Chairman, John Marshall, opened the meeting by emphasising that, though analyses figures were valuable, the quantity of silage made was all-important. To illustrate this point, he related the story of a boy who cut a lawn and, having the clippings analysed, found these gave the highest analysis that year, albeit on a minute quantity.

The Chairman introduced the Silage Judge, Alistair Watt, who had been silage champion in the North of Scotland Grassland Society in 1993. He thanked the South West Society especially the Chairman and Committee, for the invitation to judge. He had found it a pleasure and had enjoyed great hospitality throughout the itinerary.

Speaking generally, he criticised the fact that almost all pits were over-filled. Everyone appeared to think 'the sky is the limit'! However, this contributed to soft sides. He also felt there was much room for the improvement of safety rails, for which he had awarded few points. One farm had no rails.

The standard of silage seen was extremely high, with much greater attention to detail than in other areas.

1994 Results

The marks awarded for analysis and inspection to the farms judged, together with final placings, are set out in the Results Table.

First prize in the Dairy Class and overall Silage Champions were A & WA McWilliam, Colfin, Stranraer, who had been in Third Place in both 1992 and 1993. They received the Society's Silver Rosebowl. Runner-up was Vice-Chairman, A H Borland, Altonhill, Kilmarnock. Third prize in the Dairy Class went to T & W McWilliam, Drumwall, Gatehouse.

In the Beef/Sheep Class, First Prize and the BP Nutrition Trophy went to W T McCombe, Trohoughton, Dumfries for the second year in succession. Runner-up was J Nelson, Cogarth, Parton, Castle Douglas. Best Big Bale Prize went to G & T L Clark, Newmains, Kirkbean, on analysis only. Best New Entrant in the short list was A R Campbell, Cuil, Castle Douglas, while I D Houston, Torkatrine, Dalbeattie received the Michael Milligan Prize for best attention to detail. This Prize took the form of a copy of John Frame' book: Improved Grassland Management. All other prizes were tankards or glasses, supplied and hand-engraved with the SWSGS logo by Burns Crystal Glass Works, Mauchline.

Prizes were also awarded to the entrants with highest analysis marks in each county. These were: Ayrshire - J Smith, Dykehead, Kilmaurs; Dumfries - Barony College, Parkgate, Dumfries; Kirkcudbright - A R Campbell, Cuil, Castle Douglas; Wigtown - E Beck, Castle Clanyard, Drummore.

Through the generosity of Plasti-Covers Ltd, Irvine, £50 cash tokens were awarded to first and second prize-winners in the Dairy Class, first in the Beef/Sheep Class and to the Best Big Bale winner.

Silage at Colfin (A & W A McWilliam - 1994 Silage Champions)
Silage fields were diploid and tetraploid PRG, cut first on 20 May. 64 ha were cut in 1.5 days, with a 24-36 hour wilt. Live system additive used as a safeguard and to prevent secondary waste at the face. Clamps were 15 m wide and cut with a sheergrab which left a tight face. No feeder wagons used and no blends. A simple system was followed using cake, silage and a little straw. The silage gave maintenance plus 12 l.

Silage Quality 1994 - N Day, SAC, Ayr
A total of 182 silages were included in the Competition; 149 Dairy and 27 Beef/Sheep and 6 Big Bale. Average analysis figures for 1994 Dairy Silages for the four counties and for the Beef/Sheep and Big Bale are summarised in Table A, together with comparable figures for 1993 in Table B.

Conditions for making silage tended to be harsher in Ayrshire. Nevertheless, the 1994 runner-up came from Ayrshire and a consistently high silage quality came from the Isle of Arran.

Overall, 1994 was an extremely good silage year. Cows had milked very well, possibly due to a check from the cold spring allowing abundant new growth at the time of the first cut. Dry matter was much higher, and average Digestibility was up by 5 units.

In Wigtown, average digestibility was up by 7 units, possibly due to higher dry matter, though change of analytical techniques could not be ruled out. Some volatile nutrients which contribute to feed value are lost during analysis, and an adjustment is made in reporting. Crude protein values were lower in 1994, although the reported figures appear higher. There was an overall improvement in the Cattle Intake Factor, possibly related to the higher dry matter.

The Beef/Sheep entries continued to show high quality.

Additives

A breakdown of available data on additive use on first cut silages submitted for SAC Analyses in Ayrshire is shown in Table C, with details of products used in Table D.

In general, formic acid was associated with best ME values, very few acid or enzyme additives were used, but many inoculants, of which Bioferm was most popular.

Percentages of competition entries attaining more than 30 marks out of 35 for analysis were: Dumfries 44, Wigtown 35, Kirkcudbright 25, Ayrshire 18.

TABLE A
SILAGE COMPETITION 1994 - ANALYSES MEANS

	DM (%)	D	CP (%)	Intake Factor (Cattle)	ME (MJ/kg DM)
Ayrshire (37)	26.6	72.8	14.7	108	11.7
Dumfries (41)	27.9	74.7	14.4	113	12.0
Kirkcudbright (40)	28.0	74.7	14.6	112	12.0
Wigtown (20)	27.6	75.3	15.3	114	12.1
Beef/Sheep (27)	26.7	69.6	13.9	103	11.1
Big Bale (6)	33.0	70.9	14.4	106	11.3

TABLE B
SILAGE COMPETITION 1993 - ANALYSES MEANS

	DM (%)	D	CP (%)	Intake Factor (Cattle)	ME (MJ/kg DM)
Ayrshire (43)	23.0	68.4	14.1	100	10.94
Dumfries (47)	27.8	70.0	13.8	100	11.2
Kirkcudbright (30)	24.0	71.0	13.8	101	11.4
Wigtown (29)	23.1	68.4	13.8	100	11.0
Beef/Sheep (38)	24.6	66.4	13.1	100	10.6
Big Bale (14)	29.8	65.9	13.1	100	10.6

( ) Number of Silages

TABLE C
ADDITIVE USE ON FIRST CUT SILAGE SAMPLES FROM AYRSHIRE, 1994

Type of Additive	No of Silages	DM (%)	D	CP (%)	Intake Factor (Cattle)	ME (MJ/kg DM)
Formic Acid	13	27.8	73.6	14.9	110	11.8
Sulphuric	2	22.7	66.3	11.4	105	10.6
Enzymes	3	26.3	73.5	13.5	112	11.7
Inoculants	34	25.2	72.0	13.4	111	11.5
None	26	27.4	71.3	14.1	106	11.4
Unknown	34	26.0	69.8	13.2	106	11.2
Big Bale	6	33.0	70.9	14.4	106	11.3

TABLE D
TYPE OF ADDITIVE USED ON FIRST CUT SILAGE IN AYRSHIRE, 1994

Formic		Enzymes		Inoculants	
Add-F	5	Clampzyme	3	Bioferm	8
Add-Safe	8			Ecosyl	5
				Pioneer	5
Total	13	Total	3	AxPhast	3
				Folia	3
				Proven Sile	3
				Live System	3
				ACT	2
				Unidentified	2
				Total	34

Coldhome Farm, Keith, Banff

Alistair Watt, the silage judge, gave a short illustrated talk about his farm in the vale of Keith, about one mile outside the town. It comprised some 104 ha, including 88 ha ploughable, the rest being rough grazing and hazelwood. Altitude was c. 150 m, rising to the highest hill at 195 m. The soil was heavy with a risk of poaching and regular subsoiling was necessary. Rainfall was 35-40 inches (975-1,000 mm) with deep snow possible in winter.

His dairy cows averaged 6,900 l, with m.o.c. of £1,300 per cow. He was upgrading to Holstein though did not want his cows too large. All youngstock were kept on slats. Young calves were individually penned on a raised floor before grouping in larger pens at 6 weeks. Quota had been purchased to increase to 0.5 million l. There was also a barley beef unit with all concentrates machine-weighed.

Three cuts of silage were taken beginning 1 June and using a Kidd mower-conditioner. The low lying fields were cut first, moving progressively uphill to give equivalent maturities. A 3.5 man team picked up 8 ha per day. Bells F100 acid additive was used and no side sheet, resulting in some shoulder waste. Lorry tyres and straw bales weighted down the sheets in his covered clamps. All first cut went to the cows receiving 42 kg/head/day, and second cut to the young-stock.

The meeting concluded with a warmly applauded vote of thanks by the vice-Chairman, Archie Borland, who particularly thanked the major sponsor: Bank of Scotland, represented by Bill Scott. Other sponsors acknowledged were: Kemira Fertilisers, Plasti-Covers Ltd., Forum Feeds Ltd., with also special thanks to SAC staff who had done so much to promote the silage competition.

GRASSLAND ENVIRONMENTAL COMPETITION

SOUTH WEST SCOTLAND 1994
GED Tiley

The results of this competition were announced during the Competition evening, held at Oswald Hall, SAC, Auchincruive, on 12 January 1995.

There had been four entries in 1994, two from Ayrshire and two from Kirkcudbright. The competition was judged by Maggie Gordon, Barfil, Crocketford Road, Dumfries; Elizabeth Garner, Conservation Specialist, Cumbria, and John Marshall, SWSGS Chairman.

The judges declared the winner to be Henry Murdoch, Torr, Dalrymple, who received first prize and the Forum Environmental Trophy. Runner-up was Tom C A Dryfe, Thornglas, Auchencairn, Castle Douglas, who received a copy of a recent book from RSPB: Farming and Conservation.

Judge Maggie Gordon commented that all four farmers shared the common feature of being set in spectacular surroundings and that all four farmers were keenly aware of the quality of the environment that they lived and worked in and also of the impact that their commercial enterprises had upon that environment. This awareness was amply demonstrated by the wide range of conservation projects, either completed, ongoing or planned, which the four entrants had engaged upon. All had sought outside advice, from FWAG and SAC advisers, on how to balance environmental and agricultural needs, as well as developing personal interests by reading or attending conservation meetings, e.g. of the RSPB.

Well-maintained hedges and dykes were in evidence, with hedges thicker for greater benefit to both flora and fauna. Other conservation measures seen were:

Woodland management for game cover and for species preservation, and sensitive management of new plantings of woodland and hedgerows.

Fencing off ditches and burn sides to minimise damage by heavier grazing animals, thus encouraging greater wildlife activity and floral diversity.

Henry Murdoch (centre) winner of the Forum Environmental Trophy in the 1994 SWSGS Grassland Environmental Competition, with Maggie Gordon, Judge (left) and SWSGS Chairman, John Marshall (right).

Weed-wiping specific weeds instead of blanket whole-field treatment, using carefully selected herbicides, at half rate strength where possible.

Use of clover to increase nitrogen available and decreasing conventional fertiliser use.

Growing trees from seed gathered from the farm and planting the young trees in tubes in gaps in the existing woodland.

Fencing off wooded areas to prevent intensive grazing and encouraging natural regeneration.

The judges noted that though each of the four farms entered had individual and quite different farm situations, the environmental standards were very similar and difficult to separate during marking. The two unplaced farms therefore should not feel discouraged as these both exhibited very important and well-managed conservation features, with well-planned environmental policy. Management and maintenance of dykes and hedges and careful control of effluent were particularly evident on all farms.

The winner, Henry Murdoch, took particular pleasure from the increased number and variety of birds occurring. He also mentioned there was the course of a Roman road on Torr, possibly associated with a stop-over Roman camp.

GRASSLAND CONSERVATION - BUT NOT FOR SILAGE!

June Randell, Senior Adviser, Dumfries & Galloway FWAG

If asked how to make good silage, most farmers would be able to detail fairly precisely the grassland management system they would use. But what about the management of grassland to encourage wildlife - this is an entirely new concept for most people. Management of grassland for conservation of wildlife is something being tackled in the revised Stewartry ESA. The emphasis of the scheme is now on management of selected areas, including wetland and herb-rich grassland, for the improvement of wildlife and of landscape.

The first question to ask is: What wildlife species are you managing for? A simple, basic question, except that different birds, plants, mammals and insects very often require different things in the grassland habitat.

The height of the vegetation in the spring, i.e. whether it is tall, short or a mosaic of both, is important to consider when it comes to attracting nesting birds. The Corncrake, for example, looks for areas of cover in which to hide when it arrives in late spring, whereas the Lapwing is looking for shorter grass or bare areas and the Snipe is looking for something in between. There is also the food source to consider. Will the birds feed mainly on insects, seeds or both? Type of food available is particularly important for the chicks. Grey partridge chicks have been found to feed entirely on insects for the first few weeks of their life. If there are no insect-rich areas there will be no chicks.

Therefore, we must aim to encourage the species of plants which will attract the types of insects required by the birds in question. The next step in the chain is then to know the grassland management necessary to promote these plants. In general, a less intensive management with fewer stock and less or no fertiliser encourages the wilder plants required, but the precise management is often specific to a particular site.

Hence, if you do not get an immediate answer to your question: 'How do I manage this wetland or grassland for wildlife?', maybe you can now realise why! With so many species to consider and all their individual requirements, many of which are as yet unknown, silage-making, in comparison, is quite straightforward!

AYRSHIRE AND ARRAN FWAG'S NEW ADVISER - LIZ GARNER

Ayrshire and Arran became the last FWAG in Scotland to fill a long-felt want and appoint its own Adviser in April 1995. This was not through lack of previous trying but finally the necessary local support was mobilised by the Chairman and Committee and Liz Garner was appointed.

Liz was born and bred on a dairy farm in Surrey and has had experience of arable and hill farming. Qualifications include a first degree in Rural Environmental Studies and an M.Sc. in Ecology at Bangor, followed by research on Soay sheep in St. Kilda and on wildlife in Ecuador. She has recent conservation experience in Cumbria and has helped judge the SWSGS Grassland Environmental Competition. As with many of the Scottish FWAG Advisers, overseas experience has lent added enthusiasm and breadth of wildlife knowledge, which is invaluable in appreciating and assessing farmers' needs.

Liz has an up-to-date knowledge of grants and schemes available to assist conservation measures on the farm. She is particularly keen to promote the whole-farm approach in which farming and conservation can be properly integrated within a planned schedule.

To date, she has been surprised how much quiet interest and sympathy there is in the appearance of the farm and of the whole countryside among many farmers in Ayrshire. Her aim is to meet as many farmers as possible to give some idea of the range of conservation possibilities available and to provide more detailed habitat information where required.

Liz is based in SAC Advisory Office, Miller Road, Ayr. Contact telephone number: 01292 264627.

STRATHCLYDE GREENBELT FWAG ADVISER
I Fraser

Established in 1991, Strathclyde Greenbelt FWAG is a farmer-led group with a balanced membership of farmers, foresters, wildlife specialists and representatives of non-statutory bodies. The group's aim is to provide independent confidential advice on reconciling commercial farming and forestry with wildlife and landscape conservation, in line with FWAG Scotland's national policy.

Based at the Scottish Agricultural College office in Abbeymill Business Centre, Paisley, my area covers farms in Strathclyde area from Kilsyth and Kirkintilloch in the East to Greenock and Inverkip in the West, together with all those in Dumbarton District.

Core funding for the post comes from Scottish Natural Heritage, Renfrew Enterprise, Eastwood District Council, Dunbartonshire Enterprise and farmer members, while SAC provides office accommodation and secretarial support.

Strathclyde Greenbelt has added problems of vandalism, illegal tipping and trespass in the areas adjacent to the main conurbation. I hope to encourage farmers in their efforts to maintain or improve local wildlife habitats, provide them with sound advice and seek out for them any financial assistance which may be available locally as well as nationally for conservation projects. A group project to improve woodlands and hedges covering nine farms and thirty-three sites has been running for three years. I hope to continue with this and look for ways of extending this type of arrangement.

Four years of practical farming experience and nineteen years as a field officer with the Scottish Milk Marketing Board, have given me a sound insight into farming in the west of Scotland, while practical training in wildlife habitat management and biological survey work with the Scottish Wildlife Trust and the Wildfowl and Wetlands Trust has increased my understanding of and enthusiasm for nature conservation over the last three years. For two seasons I have helped with a raptor protection programme organised by the National Trust for Scotland with technical back-up from the RSPB and following the Braer incident was part of a team recording conditions around Shetland's coastline and helping to collect oiled seabirds and seals.

If you are FWAG members, do pass on your enthusiasm to your friends and neighbours. Encourage them to look and see what you have done on your own farms. If they want to know more about FWAG or want specific advice on any subject relating to conservation, ask them to contact me at the address below or, better still, become a member of FWAG.

Ian Fraser
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Strathclyde Greenbelt FWAG
SAC
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FWAG - YOUR LOCAL AND NATIONAL CONSERVATION ORGANISATION

FWAG nationally promotes wildlife and landscape conservation within the context of a profitable farm business, through a team of 58 advisers.

With an annual budget of around £500,000 and headquarters at Ingliston, **FWAG Scotland** currently employs 19 advisers, supported by 15 branches, each with its own voluntary farmer-led committee. By promoting an Environmentally Responsible Farming approach, this team of advisers works directly with Scottish farmers and land managers to encourage farming practices which minimise their impact on the environment.

Scottish membership currently stands at 2,000.

FWAG Scotland is assisted by core funding generously provided by Scottish Natural Heritage.

GREEN SEEDS FOR GREEN SWARDS!

DW Beaton, AF Scotland, Dalbeattie

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The fungicide acts to protect the developing seed from seedling diseases and reduces field losses, while the growth promoter helps sustain the developing seedling under conditions of stress and gives it a vigorous start in life. Trials have shown 25% improvements in establishment compared with untreated seed. Poor establishment or failure can be a very costly exercise for the livestock farmer and AF regards the treatment of grass as a long overdue insurance to achieve the best results possible.

With the price of grass seed increasing significantly this year and for the foreseeable future, the case for using a seed treatment is stronger than ever before. Details on how your seeds can receive the best start in life are available from: AF Scotland, Biggar Mill, Dalbeattie, DG5 4BD. Tel: 01556 610414.

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IN TIME OF SHORTAGES AND HIGH PRICES BE SURE TO CHECK YOUR GRASS VARIETIES

Ian Watson, HF Seeds Ltd

1995 has seen the first real change in grass seed prices for many years, and it looks likely that prices are set to rise still further. These dramatic price increases have been caused by an unprecedented change in straight variety supply from a situation of surplus to one of shortage, almost overnight, as the law of supply and demand takes effect yet again.

The reasons behind this sudden change in supply lie in the economics of growing grass as a seed crop. Grass seed production in recent years has outstripped demand as livestock numbers have been reduced and farmers have generally sown less grass seed. The increasing popularity of forage maize has also reduced the UK grass seed market. This oversupply has resulted in relatively poor prices to grass seed growers, particularly when compared to returns from cereals and other arable crops. As often happens within the agricultural industry, price swings can create a feast or famine, and in 1994 these low prices caused a sudden and massive drop in European grass seed production by over 30%. This huge reduction in harvested acreage caught the trade completely by surprise, and has created serious shortages of the better varieties. If these can be got at all, they are now trading between seed merchants at more than twice the price level of just 12 months ago. Unfortunately, with the lead time involved in grass seed production, these higher prices will not influence supply until the 1997 mixing season and the stage is now set for even higher prices in 1996.

Much will depend, however, on the autumn selling season, particularly in England and Wales where the bulk of reseeding is done in the summer months, and on grass seed yields from 1995 crops. The worst case scenario would be a strong autumn reseed market coupled with a dry summer throughout Europe, leading to poor grass seed yields from the 1995 harvest. Given the dramatic reduction in the European grass seed acreage, poor 1995 harvest yields would take already fairly serious shortages into disaster proportions and could push mixture prices up as high as £120-140 per hectare. One possible consequence of the current shortage would be a deterioration in the quality of grass seed mixtures on offer to the Scottish farmer. As the seed trade struggles for supply, there is already clear evidence

of a general reduction in seed standards in terms not only of variety selection and mixture recipes, but also of germination and purity. With the current shortages many seed merchants are being forced to take what they can get, and mixtures are being designed on the basis of variety availability and price rather than technical merit. Furthermore, in this sellers' market, germination and purity standards have become almost irrelevant as merchants compete for what little seed is available. The inevitable effect of these market pressures will be falling quality standards, resulting in poorer sward performance and increased weed problems.

Variety selection and individual inclusion rates in the mixtures will affect sward performance in many different ways, but perhaps the sward characteristic at most risk from the current supply situation is forage quality. Huge differences exist between varieties with regard to stemminess and resultant digestibility for both grazing and silage production. Perennial ryegrass varieties such as Merlinda, for example, which is still fairly readily available, have poorer forage quality, whereas varieties with good forage quality such as Profit are in very short supply and have all but disappeared from some merchant's mixtures.

Sward density, an absolutely necessity in South West and Central Scotland, is also at serious risk. Many of the cheaper and more readily available early, intermediate and tetraploid varieties tend to have poorer sward density than the later heading types which have been hardest hit in terms of supply. Even some of the modern varieties score poorly on sward density, with varieties like Aberelan comparing unfavourably with much denser types like Merganda.

The main message for the remainder of 1995 and 1996 is that even at higher prices, a good grass seed mixture, down for 5-8 years or even longer, represents excellent value for money. Don't forget that farmers in England are paying £132 per hectare every year for seed for a single crop of maize silage, with none of the flexibility of a good field of grass. The other, and essential message, is to be sure to ask your supplier what varieties, and how much of each is being included in the mixture, and be sure that you understand how these varieties and their inclusion rates will affect sward performance. In a year of shortages where variety availability, rather than technical merit, will determine mixture recipes, it could well be worthwhile to check your Grass Varieties.

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FERTILISERS - PAST, PRESENT AND FUTURE

A Meeting of SWSGS at Douglas Arms Hotel, Castle Douglas on 16 February 1995

H. Stan Blundell and George J.M. Grierson
Kemira Fertilisers

Stan Blundell, National Development Manager, based in Ince, Chester and George Grierson, based in Dumfries, represented Kemira Fertilisers, who sponsored the evening meeting.

Mr Blundell began by briefly sketching the history of the fertiliser industry. It had started by archaic procedures such as the use of crushed bones; guano was discovered in the early 19th century. The results of a manurial experiment in Scotland published in 'The Field' 1878 showed that fertilisers were worthwhile in increasing the yields of turnips (bonemeal, sulphate of ammonia, super phosphate). Fertiliser was manufactured cheaply from nitrogen in the atmosphere and sold as ammonium sulphate. The industry had now grown to one which was very intensive and precise.

Fertilisers were all produced from natural products to feed plants which would feed people. World population was projected to grow from 2 billion in 1950 to 6 billion in the year 2000, and 10 billion in 2100. The expansion would come mainly in the Third World and the extra people would all need to be fed. Estimated World fertiliser consumption increased from 80 million tonnes in 1950 to 150 million tonnes in 1991, with a similar level projected for 2000. Consumption per head was, however, heavily weighted towards industrialised society with average values of 60 kg each of N, P, K compared with African society with averages of 6 kg of each nutrient. For every 100 inhabitants in the World Village:

1	has College education
6	own half the wealth of the village
15	are adequately housed
30	can read and write
50	are hungry most of the time

The challenge of the fertiliser industry was to try and feed the hungry 50. Current low consumption in developing countries was rising steadily, whereas in developed countries consumption was more static.

The speaker considered some of the factors that were contributing to rising costs of fertilisers. A major factor was increased commercialisation in the countries of the former Soviet Union, who now demanded higher prices and hard currency for the supply of ammonia and urea. Producer plants were widely scattered and up to 4000 km from the Black Sea ports, so prices were vulnerable to rising transport costs.

For phosphate, there were only few producers (North America, North Africa and the former Soviet Union), and marketing was controlled. Prices were rising. Potash was at present in over supply in Europe, but with a relatively low price marketing policy however.

The main producers of plant nutrients were Asia (33% of world total), North America (28%), former Soviet Union (20%) and European Union (12%). There had been a restructuring of the compound fertiliser industry in the European Union, with a reduction in capacity of 10 million tonnes from 1990 to 1994. Supply of ammonia nitrate exceeded demand by 20 percent.

Fertiliser industry stock inventories showed a progressive underlying decline from 1992 onwards. The expected impact on British agriculture were:

- Current situation will continue
- Ammonia will level at US \$150 t^{-1} f.o.b. and phosphate prices will remain firm
- Blenders will have a more difficult time
- Fertilisers will cost more
- Supply will just about meet demand
- UK fertiliser producers will remain in profit

Regrettably, the main speaker, Stan Blundell, became indisposed due to illness. The meeting continued as a discussion led by George Grierson.

All farmers were looking for fertilisers which increased early growth of grass. There were problems however, of being able to utilise this and a fear of loss of nutrients through leaching.

A new Kemira compound was designed to be leach resistant, as it contained some of its N as ammonia-N. There was also soluble P readily absorbed in the herbage for animal benefit. Other products were designed to boost silage yields. All compounds contained water soluble P. Kayenne was the only blended product.

Other topics discussed were: potash depletion in grassland; new regulations requiring delivery drivers to pass a test to carry hazardous loads, including fertiliser; regulations regarding storage of fertilisers containing more than 28% N in quantities above 25 tonnes; weatherproof packs; use of S, Na and urea; value of soluble phosphate to give better root growth for improved drought resistance and N response.

SOUTH WEST SCOTLAND GRASSLAND SOCIETY
Vice Presidents Prize 1994

This prize is awarded annually to the best Grassland student on the Higher National courses in Agriculture and Agricultural Science at SAC Auchincruive. At the prize-giving ceremony in October 1994 the Vice-President's prize was awarded to Mr Bruce Charter, who comes from Cambridgeshire, joined the HND Agriculture course as a mature student having worked for three years on crop trials with the National Institute of Agricultural Botany (NIAB). Having gained his HND with Distinction, Bruce has now progressed to the BSc course in Applied Plant and Animal Science at SAC Auchincruive.

CLOVER BLEND TECHNOLOGY

Robert McHaffie, McGill & Smith (Seeds) Ltd

There can be few farmers today who seriously doubt the value of clover in their swards. In addition to its ability to fix up to 250 kg/ha of nitrogen, promoting herbage production, it has many nutritional benefits that can lead to dramatic increases in liveweight gain and milk yields. Yet despite these advantages, the majority of farms suffer a paucity of clover, even in recently reseeded pastures. Most seed mixtures contain a proportion of clover, but it is a sad fact that within a year or so of sowing, the clover content will have disappeared. This is largely due to the inability of clover to survive even slight changes in sward management. Typically, large leaved clovers will not do well under grazing, whilst they are ideally suited to silage and under this management are fairly tolerant of applied nitrogen. On the other side of the coin are the small leaved clovers ideally suited to hard grazing, but soon disappearing under a cutting regime, particularly if nitrogen is applied. Another problem is that sheep selectively graze clovers and large clearly visible plants are soon grazed out of a developing sward.

With these problems in mind, Sinclair McGill Seeds commissioned a study of clover and grass compatibility by the long-established clover breeders, The Welsh Plant Breeding Station. After three years of painstaking research, they arrived at a series of clover blends adapted to specific types of grass mixture and management regimes which eliminate most of the aforementioned problems of clover reduction. These blends are based on the hardier Aberystwyth-bred varieties, and take into account competition factors between the different types of clover as well as their compatibility with different grasses. As you can imagine, the equation of management x variety x competition is a very complex one, and the correct proportions of the different clover types in the blends are absolutely crucial.

In summary, the CLOVERPLUS blend is best suited to medium term mixtures under a typical rotational management regime, whereas the TWEED blend is a more persistent blend for long term mixtures. CHEVIOT is specially developed for the demands of intensive sheep grazing. Nearly all the grass seed mixtures in the Sinclair McGill range now incorporate these clover blends. Further research on grass seed mixtures and clover blends is continuing at the SAC Crichton Royal Farm, Dumfries in association with

Sinclair McGill. This project will ascertain the suitability of new clover and grass varieties under dairy grazing conditions. The trial was established in April 1995, and has already yielded some valuable data.

More details of clover blend technology can be found in Sinclair McGill's new 56-page Farmers' Handbook, which is available free of charge from authorised distributors, or direct from Sinclair McGill Seeds Ltd on 01529 302065.

CENTRAL SCOTLAND GRASSLAND SOCIETY FARM VISITS 1994

In May, visits were made to dairy, beef and hill farms in Perthshire. These were Dargill (dairy), East Crieffvechter and Woodburn (suckler cows and bull beef) and Beannie (suckler cows and hill sheep). The summer evening visit was to Ben Cloich, Lennoxtown to see high yielding dairy cows. The November visits were to Newlands, Uddingston (R Millar) with pedigree Ayrshires and to Flemington, Cambuslang (Robb Bros) with a suckler herd.

The Panel evening on 8 February 1995, held at the Newhouse Hotel, included Panel Members: Mrs M Anderson, West Braehead, Forth; Sandy Bankier, Fernieshaw, Cleland; Gavin Millar (Snr), Gallamuir, Plean; Ken Phillips, SAC Lanark.

RESEARCH IN SOUTH WEST SCOTLAND

Liz McKendrick & J Bax, SAC Crichton Royal Farm, Dumfries

A: Crichton Royal Farm, Dumfries

1 Different DM Content Buffer Feeds for Milk Production

A trial carried out during Summer 1993 compared 4 groups of 10 Holstein-Friesian cows (5 spring; 5 autumn-calvers) on 4 types of diet:

a) No buffer fed
b) Buffer - 30% DM content
c) Buffer - 50% DM content
d) Buffer - 80% DM content

All cows grazed rotationally. Different DM levels achieved by adding different amounts of water to the sugar beet pulp component of the buffer feed, which also included chopped barley, urea and molasses. The buffer was fed for one hour after both a.m. and p.m. milking with no other concentrates.

Results:

The spring calving (early lactation) cows responded to buffer feeding with increased milk yields; the autumn calving cows did not. Milk yield responses increased as DM content of the buffer increased. 50% DM was considered optimum.

2 Management of Calved Heifers

Observations have indicated that where newly calved heifers have been managed in a separate group from cows, it is beneficial to continue to house heifers separately. Having been reared together from birth, the heifers are accustomed to each other within the group. There is little bullying or competition at the feed face. Benefits include reduced loss in body condition in the first 6-8 weeks from calving compared with heifers mixed with cows. Milk yields also peaked earlier and remained stable over a longer period.

3 Extended Grazing

Dairy cattle at Crichton Royal Farm normally housed in October, were grazed for a period of 3 hours a day up to the first week of December.

This extended grazing system was implemented by closing off 16 of the total 46 ha available in early September, which provided good quality grazing from October onwards. Poaching damage was minimised by walking cows over long ungrazed grass and backfencing them into the grazing area. Each strip was grazed for one day only. The use of alternate gates combined with good roadways minimised damage to the field entrances.

Overnight silage allocation was not restricted, but the cows went out to grazing straight after milking, ensuring that the cows had an appetite. Poaching is reduced when cows are grazing effectively, rather than walking around. The technique is particularly relevant to clover-rich swards which continue to grow vigorously in the autumn. Following its initial success, extended grazing will be further evaluated.

B: Auchincruive, Ayr

1 Comparison of Starch and Fibre Based Concentrates for Grazing Cows

Four types of concentrate were fed to summer calving cows grazed on high intake, high density swards for 15 weeks from 1 June.

a) Barley based concentrate, 5 kg day^{-1}
b) Molassed sugar beet pulp, 5 kg day^{-1}
c) Dark grains/sugar beet pulp unit, 5 kg day^{-1}
d) Molassed sugar beet pulp at a stepped rate:
weeks 1-5, 3 kg; weeks 6-10, 5 kg; weeks 11-15, 7 kg day^{-1}

Results: Higher milk yields, milk protein yields but lower milk fat from barley-fed cows. No difference in milk yield or milk composition between stepped rate and flat rate sugar beet pulp feeds.

WEATHER DATA FOR 1994

SAC AUCHINCRUIVE (55⁰ 29'N 4⁰34'W) Alt. 45m

Month	*Mean Air Temp ⁰C* Max	Min	*Mean Soil Temp ⁰C* At 10 cm	*Rainfall* Total (mm)	No. of Days	*Sunshine* Total Hours
January	7.0	1.9	3.0	129.9	25	36.8
February	5.1	0.7	2.0	53.2	14	64.6
March	8.6	3.1	4.6	125.7	28	68.1
April	10.7	3.3	6.1	74.2	22	126.3
May	14.2	5.1	9.6	7.9	5	191.9
June	15.3	9.3	12.1	54.8	20	116.6
July	19.2	11.5	15.0	11.0	12	166.9
August	17.0	10.6	13.8	90.8	18	151.2
September	14.8	8.1	11.1	67.8	16	111.0
October	12.4	6.6	9.0	57.1	18	77.3
November	11.7	7.6	8.7	119.1	21	44.5
December	8.7	3.3	5.6	190.2	26	32.4
TOTAL	**12.1**	**5.9**	**8.4**	**81.8**	**225**	**1187.6**

Max air temperature: 23.9⁰C on 31 July; Lowest Min: -5.7 on 21 Dec 1993
First Frost: 13 Oct 1993; Last Frost: 19 May 1994

WEATHER DATA FOR 1994

SAC CRICHTON ROYAL FARM (55°03'N 3°35'W) Alt 65m

	Mean Air Temp °C		*Rainfall*		*Sunshine*
Month	**Max**	**Min**	**Total (mm)**	**No. of Days**	**Total Hours**
January	6.1	1.4	161.1	26	13.1
February	5.5	-0.7	95.1	14	27.3
March	9.0	2.4	115.6	24	89.5
April	11.3	2.5	68.0	19	153.9
May	14.2	4.5	14.9	6	153.9
June	14.6	8.1	54.4	14	99.8
July	19.9	10.3	105.2	19	167.7
August	17.8	9.5	91.0	14	143.6
September	14.9	7.0	52.1	11	46.2
October	13.1	4.6	86.0	16	101.7
November	11.7	5.8	137.6	24	38.6
December	9.0	1.8	171.5	26	33.0
TOTAL	**12.3**	**4.8**	**1152.5**	**213**	**1068.3**

Max air temperature: 24.1 on 19 July; Lowest Min: -6.9 on 17 February
First Frost: 4 October 1994; Last Frost: 20 May.

The 1994 Weather was characterised by a wet Spring, cold dry May, cool Summer and wet Autumn.

Meteorological data reproduced courtesy SAC Auchincruive, and SAC Crichton Royal Farm.

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